

## Claims

1. A tool honing guide and bevel setting jig for honing a tool, comprising:  
a guide comprising a tool holder and a roller, and  
a jig for removable coupling to the guide to facilitate positioning the tool in the guide to form a bevel at a predetermined angle.
2. The tool honing guide and bevel setting jig of claim 1, wherein the tool has a cutting arris defined by a bevel and a reference surface, wherein the guide has a reference surface for contact with the tool, and wherein the tool is positioned within the guide with contact between the tool reference surface and the guide reference surface.
3. The tool honing guide and bevel setting jig of claim 2, wherein the tool is secured in the guide by drawing a tool securing bar toward the guide reference surface to capture the tool between the bar and the guide reference surface.
4. The tool honing guide and bevel setting jig of claim 2, where at least a central portion of the bar has a generally triangular cross sectional shape.
5. The tool honing guide and bevel setting jig of claim 1, wherein the jig has at least one positioning surface for contact with a side of a tool during positioning of the tool in the jig.
6. The tool honing guide and bevel setting jig of claim 1, wherein the jig is adapted to be coupled to the guide in multiple positions, and further comprising indicia on at least one of the guide or jig to facilitate desirable positioning of the jig when coupling the jig to the guide so that the tool will be desirably positioned in the guide.
7. The tool honing guide and bevel setting jig of claim 3, wherein the positioning surface is not square to the setting jig for positioning a skew end tool in the guide.
8. The tool honing guide and bevel setting jig of claim 1, further comprising a repositionable stop for establishing projection of the tool from the guide.

9. The tool honing guide and bevel setting jig of claim 1, further comprising a mechanism for positioning the roller in at least two locations relative to the tool holder to facilitate formation on a tool of a primary bevel with the roller in one of the at least two locations and a micro bevel with the roller in another of the at least two locations.

10. The tool honing guide and bevel setting jig of claim 9, wherein the mechanism positions the roller in the at least two locations by moving the position of an axle on which the roller rotates.

11. The tool honing guide and bevel setting jig of claim 10, wherein the mechanism moves the position of the axle by rotating an eccentric shaft on which the axle is located between a first and a second rotational position.

12. The tool honing guide and bevel setting jig of claim 11, wherein the rotation is accomplished by manipulating a knob attached to the eccentric shaft axially against a spring and rotationally between a first and a second detent in one of the knob or an associated guide structure.

13. The tool honing guide and bevel setting jig of claim 1, wherein the jig is releasably attachable to the guide by clamping the jig against a dovetail structure on the guide.

14. The tool honing guide and bevel setting jig of claim 1, further comprising a stop repositionable on the jig to provide a reference surface to facilitate positioning the tool in the guide to form bevels at a desired predetermined angle.

15. A tool honing guide for a tool having a cutting arris defined by a bevel and a reference surface, the guide comprising:

- (a) a guide body having a reference surface for contact with the tool reference surface,
- (b) structure accessible above the tool reference surface for securing the tool within the guide body, and.

(c) a roller mounted on the guide body for contact with an abrasive surface.

16. The tool honing guide of claim 15, wherein the tool is secured in the guide by drawing a tool securing bar toward the guide reference surface to capture the tool between the bar and the guide reference surface.

17. The tool honing guide of claim 16, wherein the shape of the bar swells from relatively constant thickness proximate two bar ends to a central portion having a generally triangular cross sectional shape.

18. The tool honing guide of claim 16, the bar is secured to the guide body with one thumb nut threaded onto each of two studs protruding from the bar and passing through two holes in the guide body.

19. The tool honing guide of claim 15, further comprising structure attached to the guide to facilitate establishing projection of the tool from the guide.

20. The tool honing guide of claim 19, wherein the facilitating structure comprises a repositionable stop.

21. The tool honing guide of claim 15, further comprising a mechanism for positioning the roller in at least two locations relative to the tool holder to facilitate formation on a tool of a primary bevel with the roller in one of the at least two locations and a micro bevel with the roller in another of the at least two locations.

22. The tool honing guide claim 21, wherein the mechanism positions the roller in the at least two locations by moving the position of an axle on which the roller rotates.

23. The tool honing guide claim 22, wherein the mechanism moves the position of the axle by rotating an eccentric shaft on which the axle is located between a first and a second rotational position.

24. The tool honing guide of claim 23, wherein the rotation is accomplished by manipulating a knob attached to the eccentric shaft axially against a spring and rotationally between a first and a second detent in one of the knob or an associated guide structure.

25. The tool honing guide of claim 15, further comprising two arcuate arms attaching the guide reference surface and tool securing structure to a roller holding structure.

26. A tool honing guide and bevel setting jig for a tool having a cutting arris defined by intersection of a bevel and a tool reference surface, the guide and jig comprising:

- a guide comprising a tool holder and a roller,
  - a. wherein the tool holder comprises a guide body comprising:
    - i. a guide reference surface against which the tool reference surface is secured with a tool bar secured to the guide body with threaded studs passing through holes in the guide body and thumb nuts threaded onto the studs,
    - ii. roller holding structure,
    - iii. two arcuate arms attaching the roller holding structure to the guide reference surface, and
    - iv. structure to which the jig may attach; and
- a jig for removable coupling to the guide to facilitate positioning the tool in the guide to form a bevel at a predetermined angle, the jig comprising:
  - a. a tool positioning surface for contact with a side of the tool,
  - b. a repositionable stop for establishing projection of the tool from the guide; and
  - c. structure for removably attaching the jig to the guide.

27. The jig and guide of claim 26, wherein the tool positioning surface on the jig is for positioning a square edge tool and further comprising a second jig for removably coupling to the guide to facilitate positioning a second tool in the guide to form a bevel on a skew edge tool, the skew jig comprising:

- a. two skewed tool positioning surfaces for contact with a side of the second, skew edge tool,
- b. a repositionable stop for establishing projection of the second tool from the guide; and
- c. structure for removably attaching the jig to the guide.

28. A method of sharpening a tool having a cutting arris formed by the intersection of a bevel and a reference surface, the method comprising:

(a) positioning the tool in a honing guide having an abrasive contact device attached to structure providing a guide reference surface:

(i) with the reference surface of the tool lying against the guide reference surface,

(ii) with a side of the tool contacting a positioning surface on a positioning jig attached to the guide, and

(iii) with projection of the tool from the guide established by a repositionable stop on the jig,

(b) removing the stop and positioning surface from contact with the tool,

(c) manipulating the jig and tool to abrade the bevel against an abrasive while maintaining contact between the abrasive and the abrasive contact device.

29. The method of sharpening a tool of claim 28, further comprising:

(d) adjusting the position of attachment of the abrasive contact device to the honing guide structure to position the abrasive contact device farther from the tool than it was located during step (c), and

(e) manipulating the jig and tool to abrade a portion of the bevel adjacent to the arris against an abrasive while maintaining contact between the abrasive and the abrasive contact device.

30. The honing guide of claim 15, wherein the roller is mounted eccentrically on a shaft, the roller having a plurality of predetermined orienting stations thereon, and shaft orienting structure mounted on the guide body for engaging selected ones of the orienting stations to select a variation in attitude of the tool.

31. The honing guide of claim 30, 1 further comprising locking structure to maintain the shaft orienting structure in engagement with the selected orienting station.

32. The honing guide of claim 31, wherein the locking structure comprises a spring and the shaft orienting structure and the orienting stations comprise mating detents and projections.

33. The honing guide of claim 15, further comprising structure for engaging a motorized grinder tool rest while contacting an abrasive surface of the grinder with the tool.

34. The honing guide and bevel setting jig of claim 1, further comprising structure on the guide for engaging a motorized grinder tool rest while contacting an abrasive surface of the grinder with the tool.

35. The honing guide and bevel setting jig of claim 1, further comprising concave surface clamping bars.

36. The honing guide and bevel setting jig of claim 1, wherein the tool holder and roller comprises structure for holding the tool repositionably attached to structure for holding the wheel so that the tool holding structure can be attached to the wheel holding structure in more than one position during use of the guide.

37. The honing guide and bevel setting jig of claim 36, wherein one of the tool holding structure or wheel holding structure has at least one ridge for receipt in at least one matching trough in the other of the wheel holding structure or the tool holding structure.

38. The honing guide and bevel setting jig of claim 37, wherein the at least one ridge comprises one ridge, and the at least one trough comprises three troughs so that the tool holding structure and wheel holding structure are positionable in three different relative positions.

39. A tool honing guide comprising a tool holder repositionably attachable in three predetermined positions to a frame holding a wheel.

40. The honing guide and bevel setting jig of claim 1, wherein the tool has top and bottom faces, and further comprising a pair of wedges, one of which is positioned between each of the top and bottom faces of the tool and the tool holder to change the angle between the tool and the tool holder.

41. The honing guide and bevel setting jig of claim 40, wherein the tool holder has two studs for securing the tool in the holder, and wherein each wedge has two ends and an opening near each end for receiving one of the two studs.

42. The honing guide and bevel setting jig of claim 40, wherein the included angle of each wedge is approximately 16 degrees.

43. A pair of wedges for use with a honing guide having a tool securing bar positioned on two studs, each wedge comprising an elongated body having a generally wedge-shaped cross section and a recess at one end of the body to receive one of the studs and a recess and leaf spring at the other end of the body to receive the other stud and secure the wedge in position within the guide.

44. The pair of wedges of claim 43, wherein each wedge can be positioned in the honing guide by sliding one of the studs into the first recess and then rotating the wedge about that stud until the second stud deflects the spring and is received in the recess at the other end of the wedge.

45. The tool honing guide and bevel setting jig for honing a tool of claim 1, further comprising a hinge disposed between the honing guide and bevel setting jig and attached to each, adapted to pivot the bevel setting jig away from an abrasive surface.